



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2018; 7(3): 178-181

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www.thepharmajournal.com

Received: 05-01-2018

Accepted: 10-02-2018

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Health benefits of nutraceuticals

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Abstract

Nutraceuticals is a word made by combining two words 'nutrition' and 'pharmaceuticals'. Nutraceuticals prevent various chronic diseases of human beings. They cure or inhibit the disorders which are related to oxidative stress, e.g. cardiovascular diseases, diabetes, inflammation, eye and immune disorders. Presently, nutraceuticals may be called as the bridge between "food" and "medicine". Nutraceuticals may be herbal products, regular nutritive products, withdrawn nutrients, vitamins, dietary supplements and processed food products (like as soups, juices, cereals, beverages). In this review, we are going to discuss the two categories of nutraceuticals, traditional and non-traditional nutraceuticals their role and benefits of nutraceuticals and adverse effects of nutraceuticals on human health and comprehensive interest of nutraceuticals in modern era.

Keywords: Nutraceuticals, nutrition, pharmaceuticals, chronic diseases

Introduction

Nutraceuticals is a combination of two words 'nutrients' and 'pharmaceuticals'. Nutraceuticals are also termed as 'Functional foods'. They may include dietary supplements, herbal ingredients, vitamins, refined foods (like soups, cereals and beverages) and nutrients [1]. Functional foods may be called as the foods which comprise one or more than one compounds with various physiologic and biochemical concern that are beneficial to human population [2]. Hippocrates stressed in the approved manner "Let food be the medicine and medicine be the food", about 2000 years past. If nutraceuticals are consumed habitually, they will be proven beneficial to human health also in lowering the risk of various harmful diseases such as cancer, diabetes, heart disorders, hypertension etc [3].

Categories of nutraceuticals

On the basis of availability of foods in market, nutraceuticals may be classified into two categories:

- Traditional nutraceuticals
- Non-traditional nutraceuticals

Traditional Nutraceuticals:

Functional foods are commonly called as traditional nutraceuticals. They are consumed as a part of regular diet so as to get valuable effects directly [4].

For example: (Prabu *et al.*, 2012)

- Cheese, eggs and milk are rich sources of omega-3 fatty acids
- Customized fatty acids and vegetable oils
- Drinks and fruit juices that increases oxidant levels
- Grains and cereals which contain sufficient amount of nutritional fiber
- Vegetables proteins which are gained from canola, legumes, soy and vegetables [5].

Traditional nutraceuticals are further divided, on the basis of

➤ Chemical Constituents

These includes:

- Nutrients, such as amino acids, animal products (meat, poultry), dairy products (milk, cheese, butter), fatty acids, fruits, minerals [6].
- Herbals, such as peppermint, lavender, cranberries [6].
- Phytochemicals, such as α , β , γ carotene, hesperidin, limonene, lutein, lycopene, rutin [7].

➤ **Probiotic Microorganisms**

- These include *Bacillus*, *Bifidobacterium*, *Enterococcus*, *Escherichia coli*, *Lactobacillus*, *Leuconostoc*, *Pediococcus*, *Saccharomyces*, *Streptococcus* [8].

➤ **Nutraceutical enzymes**

- These are α -galactosidase (asparagus, beans, broccoli, whole grains), biodiastase (soybean), β -amylase (higher plants), bromelain (pineapple), chymotrypsin (vertebrates of all classes), oxbile (ox), pectinase (cell wall) and pepsin (tracheal secretions in animals) [9].

Nontraditional Nutraceuticals

These are the products or plant materials which are prepared artificially. These are biotechnologically engineered foods, follow-on added ingredients or agricultural breeding [10]. Cereals bred by adding vitamins and minerals, flour fortified with folic acid and orange juice prepared adding calcium are used to enhance the valuable properties of these products [11].

Health impact of nutraceuticals on human health

Modern lifestyle assumed by the people is totally different regarding basic habits of diet of later. At present, excess of consumption of junk foods leads to an integral cause of diseases, which is a result of inappropriate intake of nutrition. Due to this, developing countries are suffering from various harmful diseases such as arthritis, cancer, heart problems, osteoporosis and many more. Here, in this section, we are going to discuss the benefits as well as the adverse effects of nutraceuticals.

Benefits of Nutraceuticals

Nutraceuticals are in use, from very past years. Recent researches and nutritional supports and medical proofs have permitted nutraceuticals to come out effectively. As we know, nutraceuticals can be derived from plants and animals which are used in food manufacturing that are helpful in creating novel food for future [12-13]. Literature revealed that dietary supplements we consume may account about 64% of nutraceuticals market. Dietary supplements play a vital role in preventing appearance of chronic diseases, its progression and mortality. From past decades, diseases can be treated or prevented by taking food as medicine. For example, table salts are fortified with iodine, flour with folic acid so as to prevent individual from iodine deficiency which may result anemia and goiter. Likewise, sometimes fortification of food is done with vitamin A to cure deficiency if vitamin A [14].

Adverse effects of Nutraceuticals

Nutraceuticals are usually considered safe but may be

dangerous. They may be dangerous because they are brought into the market without any experimental assessment or clinical trials. The adverse effects associated with the intake of dietary supplements were first time marked after the emergence of the case reports of the signs of intake of some dietary supplements. According to report, it has been found that about 33% adults in US consume multivitamins¹⁵. This value is considered very high to be consumed by a normal adult. The adverse effects of nutraceuticals on human health are:

- Higher intake of pyridoxine (vitamin B6) may cause pyridoxine-associated sensory polyneuropathy in old age patients that consumes multivitamins [16-17].
- α -Trocopherol and β -Carotene are phytoconstituents which are studied in cancer prevention studies, but the male who is use to of smoking may be affected by α -Trocopherol and β -Carotene i.e., there is risk of lungs cancer [18].
- There may be greater chances of occurrence of congenial irregularity in the babies which are born to ladies that consume vitamin A in high amount [19].
- Patients with persistent hypervitaminosis A, consuming supplements, are also reported with intrahepatic cholestasis after 12 years [20].
- It is reported that omega-3 fatty acids and fish oil is well tolerated and is little toxic when taken at a dose level of 1000-2000 mg/day. But in case of patients taking anticoagulants (like warfarin), they may intensify anticoagulations and increase hemorrhage [21].

Comprehensive interest of nutraceuticals in modern era

Today, plants have been proved the richest source for improving human health. Food originated from either natural (like plants, animals or microbes) or synthetic means, provide nutrition for rebirth of humanoid health [22]. Relying on the nature and the alternative use of nutraceuticals, it has been proved that use of conventional medicine have reduced and also have decreased the risk of harmful effects [23]. Nutraceuticals have come out as beneficial product for health acquired from many industries i.e. meals, herbals and pharmaceutical manufacturing [24]. The importance of such products have been related with the cure of many health problem including most cancers, metabolic harms, bloodless and cough, downheartedness, coronary heart ailment, behind schedule gastrointestinal emptying, and lots of extra conditions which requires unique care. Ingredients and nutrients play a crucial role in regular functioning of body [23]. Nutraceutical against various diseases are discussed below, in table no. 1:

Table 1: Examples of some nutraceuticals in the treatment and prevention of diseases.

S. no.	Nutraceuticals	Diseases	References
1.	Amla	Amla fight against bleeding disorders, diabetes, chronic cough, cancer, influenza, improves immunity	24
2.	Beer	Beer reduces chances of cardiovascular, neurodegenerative diseases, cancer; helps in treatment of bladder stones	25
3.	Chocolate	It decreases risk of low blood pressure and acts as antioxidant, anti-inflammatory anti-cholesterol and anti-platelet	26
4.	Fish	Consumption of fish reduces cardiovascular risk	27
5.	Green tea	It cures inflammatory bowel disease, weight loss, hair loss, skin disease	28
6.	Honey	Honey have antibacterial, antiviral, antifungal, anticancer properties; it helps in keeping skin nourished	29
7.	Jackfruit	Consumption of jackfruit helps in the prevention of diabetes, obesity, cancer and cardiovascular diseases	30
8.	Milk	Milk is helpful prevention of dental caries, dehydration, respiratory problems, obesity, hypertension, osteoporosis	31
9.	Soy	Soy have found to be beneficial in lowering the threat of cardiovascular; it improves bone density, dementia and cognitive decline	32
10.	Yogurt	It is used as a preventive agent for constipation, bacterial infections, vaginal yeast infection and urinary tract infections;; it improves muscle strength and is also beneficial in diabetes, treating high cholesterol, HIV/ADS, stomach ulcers, sunburns and colorectal cancer and sunburns	33

Conclusion

Authors had discussed the role and significance of nutraceuticals on human health. Nutraceuticals are available in market without a prescription, and their use is not regulated and controlled. Numerous nutraceuticals have potent effects and are remarkably safe, so their risks need to be indentified and controlled. Side effects could come from nutraceuticals like allergic reactions, insomnia, cardiac arrhythmias, interactions with other nutraceuticals and therapeutic drugs, excessive blood thinning, and other serious conditions. Nutraceuticals may behave like drugs it should be regulated like prescription medicine and not like over the counter medicines.

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